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THE EFFECTS OF A DECISION BALANCE SHEET INTERVENTION UPON EXERCISE ADHERENCE OF HIGH AND LOW SELF-MOTIVATED FEMALES.

by

© JOHN H. GRAHAM

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF ARTS IN RECREATION ADMINISTRATION.

DEPARTMENT OF PHYSICAL EDUCATION

EDMONTON, ALBERTA

FALL, 1979

THE UNIVERSITY OF ALBERTA

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled The Effects of a Decision Balance Sheet Intervention Upon Exercise Adherence of High and Low Self-Motivated Females submitted by John H. Graham in partial fulfilment of the requirements for the degree of Master of Arts.

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Date..August 28, 1979

DEDICATION

To the memory of my mother and father, Violet and Herbert Graham, for the joy of being raised in their love.

ABSTRACT

The purpose of this study was to categorize females in a fitness program into high and low self-motivated groups according to their score on a Self Motivation Inventory, and to conduct a telephone interview incorporating a decision balance sheet format in an attempt to encourage adherence to the exercise classes. Three hypotheses were formulated and tested in the study:

1. Subjects scoring high on the Self Motivation Inventory would attend more exercise classes than subjects scoring low on the Inventory.
2. Subjects administered the telephone interview decision balance sheet would attend more classes than subjects in a control group.
3. The decision balance sheet treatment would have a greater positive effect on the program attendance of low self-motivated subjects than high self-motivated subjects.

Fifty-two female participants in the five week Y.M.C.A. Shape-Up Edmonton Fitness Program were dichotomized into high and low self-motivation groups according to their score on the Self Motivation Inventory. Paired subjects (matched according to similar SMI scores) were then randonly assigned to either a treatment condition (telephone interview and decision balance sheet) or control condition (no researcher contact). Prior to the second class in the series, the researcher telephoned all treatment

subjects and assisted them to formulate a decision balance sheet concerning the likely gains and losses involved in their commitment to the exercise class. The attendance of subjects over weeks two, three, four and five was the planned dependent variable. However, due to a program postponement at one venue, the attendance of subjects for weeks two, three and four only was utilized for that purpose.

The analysis of variance indicated a significant effect on the decision balance sheet treatment, but F values for self-motivation and treatment x self-motivation were non-significant. To examine group trends over time, regression analysis was conducted to calculate and compare group dropout rates for the first four weeks of the program. Results of that analysis indicated that the low self-motivated treatment group evidenced a significantly lower dropout rate than the low self-motivated control group, while no difference was observed between the dropout rates characteristics of the high self-motivated groups. The utility of administering the Self Motivation Inventory to locate potential exercise drop-outs and then employing a decision balance sheet treatment to that particular group to encourage adherence was therefore given some support by the results of this study.

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CHAPTER I

STATEMENT OF THE PROBLEM

Introduction

The adoption of physically active lifestyles by individuals has been encouraged by governments and private agencies throughout the Western World in recent years. Spawned largely by reported connections between exercise and positive states of mental and physical health, and nourished by suspected links between exercise and cardiovascular health (Kannell, Castelli and McNamara, 1967; Mann, Garrett, Farhi, Murray and Billings, 1969; Shephard, 1969), adult exercise has been promoted by mass participation campaigns such as 'Participaction' in Canada (Jackson, 1979), and 'Trimm' in the Federal Republic of Germany (Palm, 1974).

Despite the multi-media approaches utilized by these campaigns to 'sell' the fitness message, the fact remains that the bulk of populations continue to be unresponsive to such initiatives (Cunningham, Montoyne, Metzner and Keller, 1968; Jackson, 1979).

An even more vexing problem for exercise promoters is that caused by the large numbers of individuals who commence but fail to adhere to formal exercise programs. Attendance records from a variety of exercise settings, including university jogging groups (Wilmore, Royce, Girandola, Katch and Katch, 1970), state fitness programs (Kasch and Carter, 1970), and training classes for post myocardial infarction patients (Saane, 1973) reveal that dropout rates of 20 to 50%

of the original participants are usual. Although motivated initially to enrol in an exercise format, many persons lack the necessary persistence to follow a prescribed program through to completion. Awareness of this problem has resulted in an increased interest in research in this area. Investigators of the attendance behavior of adults enrolled in exercise classes have traditionally followed either of two approaches.

One approach focuses on identifying the characteristics which distinguish participants from non-participants. Typical studies have examined personality traits (Brunner, 1969; Ismail and Trachtman, 1973), motivational differentials (Keith, Spurgeon, Blair and Carter, 1974) and attitudes (Sonstroem, 1974).

The second approach attempts to identify key elements in program presentation which are associated with participant attendance. The importance of locating the exercise facility convenient to potential users (Perrin, 1979; Wanzel, 1978), the need for effective leadership (Brawley, 1979; Wankel, 1979) and the social involvement of the exerciser with his/her network of family and friends (Heinzelmann, 1973) are among the many factors considered vital in this regard. Despite such directions, the exercise program which retains the majority of its participants throughout remains an exception rather than the rule.

The failure of either approach to develop strategies for the prediction and control of exercise behavior is no

surprise to psychologists who espouse an interactionist theory of behavior. Whereas trait and situational theorists have typically located the main causal factors in the person or the situation respectively, Endler and Magnusson (1976), Moos (1969) and Bowers (1973) are representative of researchers who argue that situations are as much a function of the person as the person's behavior is a function of the situation. That is, actual behavior is determined by a process in which person and situation factors interact in a continuous (bi-directional) feedback manner. The investigative interactionist model therefore treats the person-situation interaction as the basic unit of analysis, and allows the examination of person x mode of response and situation x mode of response interactions as well (Bowers, 1973).

Fisher, Horsfall and Norris (1977), examining anxiety levels and game situations among basketball players, demonstrated the importance of interactional variables in a sport setting. However, the interactionist paradigm has not been utilized in the study of exercising behavior, the focus of the current investigation.

The personal and situational variables selected for this investigation of the interactional approach for facilitating attendance in an exercise class were a general disposition to persevere, as measured by the Self Motivation Inventory (SMI) (Dishman, Ickes and Morgan, in press) and the various expected contingencies which mediate a person's commitment to a decision. Specifically, it involved the

categorization of subjects into high and low self-motivation groups according to their scores on the SMI, and the integration of how a telephone interview incorporating a decision balance sheet format (Hoyt and Janis, 1975) affected adherence to the exercise class.

Research hypotheses

For experimental purposes, it was hypothesized that:

1. Subjects scoring high on the SMI would attend more exercise classes than subjects scoring low on the SMI.
2. Subjects administered the telephone interview decision balance sheet treatment would attend more classes than subjects in a control group.
3. The decision balance sheet treatment would have a greater positive effect on the program attendance of low self-motivated subjects than high self-motivated subjects.

Justification for the study

This study was designed to extend our knowledge about motivation for exercise attendance by investigating the effects of a treatment variable upon subjects categorized with respect to a personal variable. The personal variable is self-motivation (persistence) as measured by the SMI while the treatment variable is completion of a decision balance sheet in a telephone interview.

The Self Motivation Inventory, developed recently by

Dishman, Ickes and Morgan (in press) has had limited application in field studies to date. In its original validation, the inventory was found to predict adherence in two different exercise settings - with inter-collegiate female rowers, and with adult males enrolled in programs of habitual physical activity. In the current study its utility for application to a different population in a short duration public exercise setting was investigated. Specifically, the exercise adherence of adult females enrolled in a voluntary fitness program of only 5 weeks duration was investigated whereas the original studies involved programs of 32 and 20 weeks respectively.

The decision balance sheet procedure adopted in the study has been used with some success by Hoyt and Janis (1975) and Wankel and Thompson (1977) in experiments relating to exercise adherence. It seeks to aid people making vital decisions by helping them to explore the potential consequences of a given decision (Janis and Mann, 1977). As the balance sheet has been shown useful in enhancing commitment to a stressful decision, it was considered to be an appropriate strategy to use with subjects whom one suspected would have difficulty in adhering to a desired course of action.

In considering the interaction of both personal and situational variables involved in exercise adherence, the study extended previous research on the topic which had focussed on one such variable only. Especially important

was the fact that each of these variables - level of self-motivation and decision balance sheet treatment - has independently demonstrated its relevance to the problem. On that basis, the testing of their combined effect in an interactional paradigm is a logical next step in the investigation of adherence behavior in exercise settings.

In addition to the above justification for the study on theoretical grounds, the study has considerable potential practical utility. The participant who commences but fails to continue to attend class presents a number of problems for program organizers:

1. The class fails to achieve its objective - to produce a positive change in the exercise habits of the individual - if that person does not complete the program.
2. The possibility exists that the individual who fails to adhere is the one who, from a health-risk standpoint, is most in need of increased physical activity.
3. Successive classes are difficult to plan if a stable participant group is not assured.

For these reasons, the value to exercise promoters of a procedure which could diagnose and then treat wayward attenders would be considerable. The strategies tested in this experiment were aimed toward that end.

Delimitations and Limitations

Delimitations

1. The study was delimited to adult females enrolled in the Y.M.C.A. Shape Up Edmonton Fitness Program.
2. It was further delimited to females attending any of the four Series D or Series E classes which were presented weekly for a total of 5 weeks.
3. Finally, the study was delimited to those female participants who satisfactorily completed the Self Motivation Inventory at each class on the first night of the program.

Limitations

1. The small number of participants enrolled at two of the selected venues was the major limitation of the study.
2. The fact that the program was of only 5 weeks duration was a second limitation. After the administration of the SMI and decision balance sheet treatment, only 4 classes remained for the attendance of participants to be observed.

Definitions

The fitness program: The 5 week Y.M.C.A. Shape Up Edmonton Fitness Program was commonly referred to throughout the study as 'the fitness program'.

Exercise class: The group of participants who enrolled

initially at each of the venues constituted the exercise class at that location.

Adhere: A person who attends or stays involved with a prescribed program or procedure is said to adhere.

Adherence: Throughout this thesis, this word describes the continued involvement of participants in an activity program.

Dropout: The term is used to describe any individual who, having committed herself to a class format involving a series of presentations, ceased to continue attending at any point throughout the series. OPERATIONALLY, the term was defined in two ways:

1. Subjects who failed to continue in the exercise program after any of the classes were considered dropouts. This occurrence was measured after each class pursuant to the initial class, resulting in four groups of dropouts.
2. For the purpose of the experimental manipulation, the pattern of non-attendance was observed in each of the four group experimental conditions. Consequently, group dropout rates were also calculated.

Dropout Rate: The average weekly loss of participants from each group was calculated by regression analysis and constituted the dropout rate for that group. Four separate dropout rates were therefore calculated.

Trait: A trait is any distinguishable, relatively enduring

way in which one individual differs from others (Guilford, 1959:6).

Self Motivation Inventory (SMI): The Self Motivation Inventory developed by Dishman, Ickes and Morgan is a 40 item Likert-type inventory for assessing perseverence or self-motivated behavior in pursuing a desired outcome. It has a possible score range from 40 to 200.

Self-motivated: Individuals who initiate their own behavior and who actively continue goal-setting, despite occurrences that have the potential to distract them, are considered self-motivated. Self-motivation was operationalized in this study as an individual's score on the SMI.

High self-motivated: Subjects whose scores on the SMI were greater than the mean score (139) for the total sample were classified as high self-motivated.

Low self-motivated: Subjects whose scores on the SMI were less than the mean score (139) for the total sample were classified as low self-motivated.

Decision balance sheet (DBS): The decision balance sheet is a method of assisting individuals in making decisions and in adhering to them. It involves an individual listing the anticipated gains and losses associated with his commitment to a decision.

CHAPTER II

REVIEW OF LITERATURE

What factors motivate some adults to develop permanent exercising habits? Why do other adults commence exercise, but fail to continue?

The review of literature pertaining to these problems is written in three parts. The first section reports research investigating the part that personal variables play in the motivation of adults to exercise. General personality trait approaches, attitudinal research related to physical activity, and finally research pertaining to the Self Motivation Inventory (Dishman, Ickes and Morgan, in press) are considered.

The second section reviews studies which have associated situational or program variables with exercise adherence, and discusses those investigations which have utilized different treatments in attempts to improve adherence behavior. This part concludes with a focus on the decision balance sheet procedure, the treatment which was incorporated into the present study.

Finally, the emphasis placed on interactional investigations in the field of social psychology is discussed as a lead-in to the interaction approach adopted in this study.

1. Personality variables

A number of studies examining personality differences

between exercisers and sedentary individuals, and between high and low fit adults, have focused on identifying traits and attitudes characteristic of these persons.

The trait approach

Traits are considered relatively stable behavioral dispositions that individuals exhibit over time (Epstein, 1977). The dominant force in personality research and theory (Endler and Magnusson, 1976), they have generally been identified through pencil and paper tests such as Cattell's 16 Personality Factor Questionnaire, the Minnesota Multiphasic Personality Inventory (MMPI), and the Motivational Analysis Test (MAT).

Brunner (1969) administered the 300 item Adjective Check List to a sample of 60 adult males. Significant differences ($p < .05$) were revealed between participants (exercising more than three times per week) and non-participants (exercising less than three times per week) on 8 of the list's 24 scales. Participants were found to possess more extroverted traits, while non-participants possessed more introverted traits.

Questionnaire responses from subjects indicated that non-participants had competed in more activities while at school, but had enjoyed them less, than their more active counterparts. Their current exercise frequency was also less than half that of the participant group.

The primary motivation for exercise stated by the more

active group was the desire to keep physically fit and the associated feeling of well being. By contrast, the irregular participants reported lack of time due to business reasons as the major reason for their inactivity.

This information led Brunner to conclude that adults attitudes towards exercise were influenced by their early activity experiences. Acknowledging a belief in the stability rather than fluctuation of personality characteristics, he suggested that it was necessary to make young people aware of, and receptive to, the values of exercise if they were to continue to participate as adults.

In an investigation yielding similar results, Harris (1970) found significant differences between active and sedentary males when she examined their background experiences. Compared to the sedentary group, a greater number of active males were found to have a history of active participation in vigorous sports, belong to physical activity clubs, have a preference for playing rather than spectating, have received sporting encouragement from their parents, and to enjoy the feeling of fatigue associated with strenuous activity.

Ismail and Trachtman (1973) selected groups of 'most fit' (N=14) and 'least fit' (N=14) individuals from a population of 60 sedentary middle-aged males. Cattell's 16 Personality Factor Questionnaire was administered to the subjects before and after a 4 month training period.

On the pretest, the high-fit group scored significantly

higher on Factor C, indicating emotional stability, and on Factor M, indicating imagination, while the low fit group scored higher on Factor O, which suggests proneness to guilt.

Post tests revealed that the scores of the low fit group on Factor C had become similar to those of the high fit group. Also the low fit group had improved on Factor M, and were higher on Factor Q_2, indicating more self-sufficiency. Of particular interest was the fact that the least fit individuals had further increased their score on Factor O, which led Ismail and Trachtman to suggest that the low fitness group, in confronting, but not conquering the problem of being unfit, could suffer guilt feelings. Also, the time off from work required to take part in physical activity, when not seen as productive, could enhance the feeling of guilt among that group.

In reporting further studies of regular and non-regular adult male exercisers, Young and Ismail (1977) and Ismail and Young (1976) note that the low Factor O scores - indicative of confidence - recorded by the active exercisers suggested that the relationship between physical fitness and self-confidence was a stable one.

Keith et al (1974) administered the Motivational Analysis Test (MAT) and a physical activity questionnaire to 92 male subjects (ages 22-68 years) in order to examine the dynamic structure differentials among active and sedentary subjects. According to their score on the

physical activity questionnaire, an active group of 33 and an inactive group of 31 were selected for the study. Results on the MAT indicated that the sedentary group scored significantly higher ($p < .05$) than the active group on the erg fear and the sentiment superego.

It was tentatively suggested that the fear erg (drive) could be explained by the fact that the inactive individuals saw physical activity as a danger or risk. Also, the sentiment superego, which purports to reflect the development of conscience and is a learned attitude, could play a part in the avoiding of activity for fear of hurting someone else.

Keith et al noted also that perhaps the lack of time expressed by many of the sedentary group as a reason for their inactivity could help explain the observed group differences on the sentiment superego. The development of conscience might be increased due to the incompatible time demands of the exercise program and business commitments.

From these studies then, it appears that high guilt feelings may be associated with dropping out of a program. However, methodological limitations expressed by Keith et al, including their failure to match subjects in both groups by age, and the use of the same group to not only derive a classification procedure, but also illustrate its efficiency, suggest that these results should be interpreted with caution.

In summary, the trait approach has provided information emphasizing the need for positive exercise habits to

be developed in the young, if adults are to enjoy activity and not suffer guilt feelings which may predispose them to avoid participation. Important though this information is to education authorities, it provides little help to the program leader who wishes to improve the current involvement of adults in exercise.

Attitudes toward exercise

An alternate approach to the investigation of motivations to exercise has involved the study of relevant attitudes. It is widely assumed that attitudes are important determinants of overt actions and consequently that any changes brought about in the attitudinal domain will have widespread effects upon subsequent behavior (Bandura, 1969). The often reported notion that most people generally hold favorable attitudes toward exercise (Ball, 1953; Kenyon, 1969; Wankel, 1979) suggests therefore that these attitudes would be related to a high degree of involvement in physical activity. Unfortunately, recent research appears to be divided on this issue.

Keogh (1963), examining responses and characteristics of men and women whose stated attitudes toward physical education were extremes of high and low, found no evidence to indicate that negative attitudes were related to non-participation. Neale et al (1969), on the other hand, observed significant correlations between attraction to physical activity and extent of voluntary participation

of adolescent boys. Harris (1970) noted that formerly inactive males who had been exercising in a supervised program for one year tended to express attitudes similar to men who had been active all their lives.

This general inconsistency of attitudinal research in the prediction of behavior has been attributed, at lease in part, by Ajzen and Fishbein (1973:41) to the common practice of using general measures of attitude toward a stimulus object to predict some specific behavior. In seeking to overcome this problem, Fishbein (1973) proposed a model which utilized specific attitudinal variables for the prediction of specific behaviors.

Arguing that the most immediate determinant of behavior (B) is the individual's specific behavior intention (BI), Fishbein theorizes that this intention is determined by the individual's attitude toward the act (Aact), his normative beliefs about performing the act (NB), and his motivation to comply with these perceived norms (Mc). The model is symbolically represented as:

$$B \sim BI = [Aact]_{w_0} + \left[\sum_{i=1} NB_i (Mc)\right]_{w_1}$$

Where Wo and W$_1$ are empirically derived weights through regression analysis.

In view of the reported success of Fishbein's model in the prediction of behavior in a number of studies (Ajzen and

Fishbein, 1973:45), Wankel and Beatty (1975) tested it in another field setting, specifically to .."determine its utility for explaining attendance of a voluntary adult physical fitness program." Their study involved the completion of a battery of tests by adult male subjects, including a behavioral prediction questionnaire, prior to commencement of an 11 week organized exercise program. The attendance record of participants was the criterion behavior measure.

Results failed to replicate the high correlations reported by Ajzen and Fishbein for earlier studies in other contexts, the correlation between behavior intention and actual behavior being only r = .11 on this occasion. The authors, however, identify a number of methodological problems encountered in their study which may account for the weak results. Especially important in this regard was a lack of variability in the behavior intention measure. All subjects expressed a high intention to regularly attend the program - these in some cases unrealistic expectations may have been partly due to lack of clear insight into the nature and demands of the exercise program.

One important recommendation made by Wankel and Beatty is that future research should adopt Kelmans (1974) advice to place attitudes within a 'context of action' in order to effectively relate them to behavior. A method which considers the context of action is the behaviorist approach- which will now be examined.

Behaviorist approaches

The behaviorist approach to the control of human behavior has been related to sport and physical activity by Rushall and Siedentop (1972). Based upon the operant conditioning model developed by Skinner (1953), behaviorism's basic premise is that behavior is controlled by its consequences, and the options available for controlling and modifying behavior lie in manipulating environmental events (Rushall, 1975).

Having observed an inappropriate behavior, the coach determines the events which are responsible for the occurrence or non-occurrence of the behavior, the elements in the behavior are completely described and identified, and a series of procedures are drawn up which progressively modify the old behavior in the desired manner.

Studies demonstrating the efficacy of this technique in physical activity settings include its use to correct the inefficient leg kick of a swimmer, and the suppression of problem behaviors among members of a competitive swim team by the introduction of a behavior game (Rushall, 1975). McKenzie and Rushall (1974) report also that the public posting of attendance information markedly reduced absenteeism among swim club members at practices.

Despite these successes, widespread application of a behaviorist approach in the modification of exercise behavior has not occurred. Whereas its use in a variety of clinical settings has been noted by Bandura (1969), a

number of problems have been identified with regard to its utility in field situations. Among the important elements involved in its use (Bandura, 1969), the considerable ingenuity required in devising incentive systems, the selection of appropriate reinforcement schedules, and the frequently necessary presence of an external agent all tend to limit its appeal to the practitioner.

However, a number of self-control procedures have been developed which shift these organizational burdens to the subject. That is, individuals regulate their own behavior by arranging appropriate contingencies for themselves. The self control process begins by informing individuals of the types of behavior they will have to practice to produce desired outcomes, of ways in which they can institute stimuli to increase the occurrence of requisite performances, and of how they can arrange self-reinforcing consequences to sustain them (Bandura, 1969).

Health related problems that have responded to self control procedures include the reduction of smoking (Tooley and Pratt, 1967) by the use of contractual agreements where clients agreed to restrict increasingly, in graduated steps, the times and places in which they engaged in the undesired behavior, and the modification of obesity (Harris, 1969; Stuart, 1967) by the regulation of stimulus conditions and self-generated consequences for the behavior. The value of self control techniques is emphasized by the fact that in the latter two studies relating to obesity, dropout rates

were remarkably low, and subjects reported no unpleasant emotional effects.

In a study directly related to the problem of motivating adults to continue exercise, Turner et al (1976) adopted a behavioral self control approach to individual exercise programming for a 26 year old married woman who had expressed the desire to slim down and become physically fit. The program included information about elementary principles of behavior, exercise, translating goals into behavioral terms, and teaching self control skills for development and maintenance of the exercise program. The subject was required to self-monitor her exercise progress by plotting an accurate graph depicting her achievement of short term goals. She was also provided with written materials explaining other self control techniques which she should employ. These techniques included the scheduling of exercise sessions, the arranging of social consequences, and contingency contracting.

After 3 weeks of the program, the subject had demonstrated highly satisfactory exercising habits, and the counsellor then provided her with written materials describing techniques for maintaining exercise behavior once long term goals had been reached. These included a self-reward system, whereby the client awarded herself points for performing the designated appropriate behaviors and cashed these points in for deserved rewards, self-punishment, which utilized a point-loss system for inap-

propriate behavior, and maintenance strategies, designed to facilitate continued exercise over time.

While the formal prescribed program of exercise lasted only 8 weeks, the subject's exercise levels were observed, and physical fitness parameters measured, over a total of 21 weeks. Results indicated that the subject had continued to exercise while unsupervised, to the extent that her fitness level showed an overall improvement of 225% since the commencement of the program, and an increase of 112% since the end of the supervised section of the program. The authors note this evidence of unsupervised exercise persistence as confirmation of the positive effects of a well planned self control program.

The considerable counsellor-client involvement required to achieve the Turner et al results is illustrative, however, of the fact that the teaching of self control procedures such as self-monitoring and self-reinforcement is better suited to the clinical setting rather than the leader-group arrangement found in public exercise classes. If, however, the reported role that exercise plays in preventive health care is correct, then the person unable to adhere to an activity program may indeed require clinical help similar to that conducted in a variety of therapeutic regimens. Before that occurs, a method of identifying the individual with a tendency to drop out is needed. In this regard, recent examinations of the construct motivation have been of considerable interest.

Motivation

The study of the drop-out problem among exercisers is relatively new. However, its incidence in relation to medical treatments is well documented (Baekland & Lundwall, 1975; Gillum & Barsky, 1974). Baekland and Lundwall observed that poor motivation was a significant factor in 34 of 41 studies related to defection from medical therapies. What is motivation? Birch and Veroff (1966) state that the selection, intensity and perseverence of behavior lie within the domain of motivation. In the case of exercise attendance, it is the perseverence element in motivation that is in need of explanation.

Behavior can be extrinsically or intrinsically motivated. It is extrinsically motivated when it is done for some external reward. The observation by Wanzel (1978) that adults who failed to achieve their exercise goals dropped out of programs earlier than goal-achievers illustrates the extrinsic factor in motivation.

By contrast, intrinsically motivated behavior is that which is motivated by one's needs for feeling competent and self-determined (Deci, 1975). Deci suggests two types of intrinsically motivated behavior involve seeking out situations which provide challenge which one has the ability to deal with, and conquering challenges which a person encounters or creates.

That feelings of competence and self-determination are not possible in all situations is well illustrated by

Czikszentmihalyi's (1975) 'flow experience' theory to account for the wholistic sensation experienced when people act with total involvement. In explanation, if the demands which an activity require of a person exceed his capabilities, he will experience anxiety. At the other extreme, if a person has excess skill for the activity demanded, he will experience boredom, which then becomes a state of frustration when his skills far surpass the opportunities for using them. The state of 'flow', in which a person is likely to persist at an activity, is when that person perceives opportunities for action as being evenly matched by his (her) capabilities. The task of structuring the ideal exercise environment for each participant in order that flow, and, hence adherence to the program might occur, would require particular skills on the part of the exercise leader.

The experimental investigation of persistence has been reported by Feather (1961) in a study which examined the relationship of persistence at a task both to its apparent difficulty and to the relative strength within an individual to achieve success and avoid failure. He found that individuals in whom motivation to succeed was greater than motivation to avoid failure, when experiencing continual failure, persisted longer when the initial probability of their success at the task was high rather than when it was low. Conversely, it was observed that subjects in whom

the motivation to avoid failure was greater than their motivation to succeed persisted longer when their probability of success was low than when it was high.

While conclusions such as these are better suited to the theoretical rather than practical situation, the importance of Feather's experiment is that it does point out that persistence as a phenomenon is determined by the interaction of both personality and situational influences.

Self motivation

In acknowledging the distinction between extrinsic and intrinsic motivation in adherence behavior, Baekland and Lundwall theorized that motivation as a personality trait in the sense of a general tendency to persevere in endeavours once they are undertaken, may be an independent construct, unrelated to the former two.

The fact that many people do persist in exercise classes lends credence to the notion that such a general tendency may be the criteria needed to accurately diagnose those participants likely to adhere from those who are likely to drop out.

A recent report by Faulkner and Stewart (1978) has documented the important role of self-motivation in exercise adherence. In this study of recruitment and retention techniques involved in motivating sedentary adults to commence a fitness program, they found that only 43.7% of the original 149 females were still adhering to the program

at its conclusion. Of those persisting, 58% indicated that self-motivation or self-interest were important in their continuing.

The self-motivation inventory

Dishman et al (in press), after examining the information regarding compliance behavior in medical settings, observed that patients most likely to discontinue were those who had previously dropped out of therapy. Similarly, self-referred patients, they noted, were less likely to drop out of treatment than were patients referred by others.

Interpreting this information to suggest that some persons are actually more self-motivated than others, Dishman et al constructed a scale - the Self Motivation Inventory (S.M.I.) - to measure self-motivation as a stable disposition. Further, they hypothesized that it (self-motivation)...would be positively related to adherence to programs of habitual physical activity.

Since the S.M.I. was the instrument utilized in the current study, its development and experimental testing will now be discussed in some detail.

An initial set of 60 items concerning an individual's tendency to persevere or to be self-motivated was administered to a sample of 401 male and female undergraduates. Additional biographical data and self-reported weekly exercise frequency was also recorded for each subject. Using a Likert format, subjects' responses concerning how character-

istic or uncharacteristic each item was of them were correlated with the summated score for all 60 items, and those correlating less than .30 were deleted. The 48 retained items, when subjected to alpha factor analysis with varimax rotation, resulted in 40 items loading at least .30 on a single factor.

Subsequent content validation tests included an item analysis which yielded an alpha reliability coefficient of .91, while loadings in excess of .30 on the total score for all items provided further evidence of the homogeneity of the underlying construct, which was labelled 'self-motivation'. The scores of 399 subjects on the initial test revealed a range of 84-184, a mean of 140.5, and a standard deviation of 19.38.

In preliminary testing, a significant correlation ($r = .23$, $p < .001$) was found between self-motivation and self-report of exercise frequency. Internal consistency ($r = .86$) and test-retest reliability (.92) after a one month interval were demonstrated in cross-validation of the inventory on a second sample of undergraduates.

Dishman et al conducted two experiments to test the predictive validity of the Self Motivation Inventory. The first study, involving female volunteers in a crew (rowing) training program of 32 weeks duration, aimed to compare the S.M.I. scores of dropouts with non-dropouts at three points during the program. Results indicated that the mean self-motivation score of dropouts was significantly lower ($p < .05$)

at all points.

A stepwise multiple regression on program adherence indicated that of the scores on a number of psychological instruments, only the self-motivation score had significant predictive effect, entering the regression equation first with a resultant correlation co-efficient of .33 ($p < .05$). Whereas self-motivation had been found previously to correlate significantly with other conceptually relevant measures such as the Thomas-Zander (1973) Ego Strength Scale ($r = .63$, $p < .005$) and the Marlowe-Crowne Social Desirability Scale (Crowne and Marlowe, 1964) ($r = .36$, $p < .01$), the fact that in this study it predicted its criterion measure - exercise frequency - better than either of these measures provided evidence of the validity of the construct.

Further, the authors suggest that because voluntary self-selection for the rowing program probably reduced the range of self-motivation scores by excluding very low self-motivated individuals, in other situations where a greater range of individuals are present, the predictive value of the S.M.I. would increase.

The second validation study was conducted with dual purposes in mind. First, it was designed to test the predictive potential of the S.M.I. with regard to the attendance behavior of individuals in an exercise program of a more therapeutic nature. Secondly, in order to better characterize the typical exercise adherer, the

researchers wished to test certain biological variables as predictors of attendance. Whereas variables such as age, height, weight and initial physical fitness had not been found useful in this matter, prior investigations by Dishman (1978) suggested that body weight, percent body fat and metabolic capacity should be further examined.

Subjects for the second study were adult males enrolled in 20 week programs of habitual physical activity. As well as the assessment of the morphologic and physiologic variables under examination, the subjects were administered the S.M.I., the Physical Estimation and Attraction Scales (PEAS), the Health Locus of Control Scale (HLC), and the Attitude Toward Physical Activity Scales (A.T.P.A.).

Daily attendance records maintained during the program comprised the dependent variable for the study. Results indicated a significant ($p < .01$) overall difference between dropouts and adherers on the variables of interest. In particular, among the psychological variables tested, self-motivation was found to have greatest predictive ability for adherence. In conjunction with two easily measured biological variables - body fat and body weight, it permitted...accurate classification of participants into actual adherence or dropout groups for approximately 80% of all cases. The failure of such "situation-specific" constructs as attitude towards physical activity, locus of control, and health consciousness, to predict exercise adherence, provided further support for the validity of the self-motivation cons-

truct.

The S.M.I. then appears to be a promising tool for the early identification of adherence among exercise class participants. One of its distinct attractions is that it is easily administered and objectively scored. If it proves consistently capable of prediction of exercise behavior, its use at the outset of an exercise regimen would permit leaders to concentrate their motivational efforts on those participants who are more likely to drop out.

Its combined use as a predictor of attendance with the biological variables identified by Dishman et al may prove an even more powerful diagnostic technique. However, the measurements necessary to assemble the required data make that combination somewhat cumbersome for everyday use in exercise classes.

Further testing of the S.M.I. in a variety of exercise settings appears warranted on the strength of evidence assembled in its favor by Dishman, Ickes and Morgan.

2. The exercise situation

The examination of the situation in which exercise takes place has revealed a broad host of factors which may have either positive or negative influences on attendance. While much of this data is derived from participants' replies to post-program evaluations, a number of experiments in exercise settings have been reported.

Reasons for exercising

A significant problem for program organizers is that often the reasons people state for initially joining an exercise class are different from the reasons they report for their continued attendance. The desire for good health, and competitive drive (Stiles, 1967), and the desire for recreation or a change in routine (Heinzelmann, 1973) are factors typically reported responsible for exercise initiation. By contrast, the thrill and enjoyment of sports participation, the challenge of difficult techniques, and the satisfaction of mastery (Stiles), the organization and leadership of the program, the games aspect, and the camaraderie or social support that is generated (Heinzelmann) are factors exercisers consider responsible for their continued involvement.

The problem for exercise planners becomes a formidable one of presenting programs flexible enough to cater not only for these changing objectives among individuals, but also for the diverse goals of participants within classes. In this regard, Heinzelmann states that.."the focus should be diverse, and take into account a variety of motivating factors, whether or not they are health-related or reflect the views of those persons organizing and/or administering the program."

The importance of fun

One basic ingredient considered essential for all

fitness classes is that the program must be seen by participants as being fun (Massie and Shephard, 1971; Perrin, 1979; Jette, 1979; McKelvey, 1979).

Although fun may not have uniform meaning across individuals, many enjoy the opportunity to meet new people in a relaxed setting and engage in activities which are 'novel, complex, and dissonant' (McKelvey). Noting that man is arousal-seeking (Ellis, 1973), McKelvey states that as an activity becomes less novel through repetition, its complexity becomes diminished and dissonance within the individual is resolved. The individual then seeks new activities to provide this arousal, progressing through a series of events which are ever more 'novel, complex, and dissonant'.

By implication, the task of the exercise leader is to ensure that the program allows for individual achievement rates, and that activities and goals are constantly revised in order to encourage and maintain interest among participants.

Goal setting

One motivational technique utilized by exercise leaders is to get participants to set goals for themselves. Danielson and Wanzel (1977), investigating the reasons for subsequent withdrawal of participants from a company fitness program, found that persons who failed to attain their exercise goals dropped out of the program much faster than

did goal attainers. At the end of 6 months, more than 92% of the non-attainers of objectives had discontinued the program. By contrast, 60% of the goal achievers had dropped out. While 83.5% of the sampled respondents had actually set goals from themselves, only 53.2% of these persons had successfully attained their objectives.

Noting that lifestyle modifications in the area of exercise require time to effect, Danielson and Wanzel caution that these results indicate the need for persons to either attain objectives they have set or to set attainable objectives. For example, persons seeking weight loss should be placed in programs involving both diet and physical activity in order that their objectives can be reached before lack of goal attainment results in their withdrawal.

Choice as an attendance factor

The importance of allowing individuals some choice in the selection of their own fitness activities or the actual class format has been reported by Massie and Shephard (1971), Leger et al (1974) and Gledhill (1975). A number of investigators have examined the influence of both choice and perceived choice on behavior.

The study by Mannell (1978) examined the effect of freedom of choice and competitive motivation on the leisure experience derived from an activity. Results indicated that subjects having no choice estimated

significantly longer activity involvement for a standard time period than did high choice subjects ($p < .05$), thus supporting the time-honored notion that time drags when one is not 'having fun'. Significant effects ($p < .01$) demonstrating that awareness of the environment decreased as a function of greater competitiveness and activity choice were also found.

Lefcourt (1973) suggests that control is a construction or illusion invented by man to make sense of his experience. In comparing studies by Glass and Singer and their colleagues (Glass, Reim and Singer, 1971; Glass, Singer and Friedman, 1969), examining man's accommodation to urban stresses, and the infrahuman studies of perceived control and response to aversive stimuli by Mowrer and Viek (1948) and Richter (1959), Lefcourt found the perception of control to be a common predictor of the response to aversive stimuli regardless of species. Lefcourt concluded that "...the sense of control, the illusion that one can exercise personal choice, has a definite and positive role in sustaining life".

Langer (1975) reports a series of studies exploring the illusion of control phenomenon in which she predicted that when factors from skill situations such as competition, choice, familiarity and involvement were introduced into chance situations, individuals would be caused to feel inappropriately confident. Confidence indicators supporting this prediction were found in situations where subjects cut

cards against either a confident or a nervous competitor, where lottery participants were or were not given a choice of ticket, or similarly, were or were not given a choice of either familiar or unfamiliar tickets, where subjects in a novel chance game either did or did not have practice and responded either themselves or by proxy, where race-track participants were asked their confidence at different times, and finally, where lottery participants either received a single three digit or one digit ticket on each of three days.

Langer's conclusion that whether or not an event is reacted to as if it is controllable largely depends on factors like competition, choice, familiarity and involvement led Thompson (1976) to examine choice, familiarity and passive involvement in a field study aimed at weight loss among 60 women members of a health club. Results indicated that the group who had been able to choose familiar foods for their diet lost significantly ($p < .05$) more weight ($\bar{x}$ = 4 pounds) than either the no-choice group (food prescribed; $\bar{x}$ = 1.7 pounds), or the control group ($\bar{x}$ = 1.2).

Also, 13 of the 20 women on the choice diet remained on their diet the entire month, while only 4 of the 20 women on the no-choice diet did so. Thompson suggests that this dietary endurance could be attributed to the resultant confidence and unwillingness of the choice group to defer from a diet which they perceived themselves as having control over.

Although these results can be interpreted as providing support for the use of choice or perceived choice in health related behavior, Thompson notes that the effect may not be due to the act of having choice itself, but rather due to higher preference for the foods in their diet by those in the choice group.

In a study directly related to the subject of adherence behavior in exercise classes, Thompson and Wankel (1978) chose to investigate the influence of perceived choice of activities on attendance. Females who had recently joined a fitness club and expressed a desire to lose weight were randomly assigned to a treatment condition (perceived choice of own exercise) or a control condition (exercise program selected by the instructor). In contrast to the earlier Thompson study, actual preference for activities was controlled for both groups on this occasion. Programs for each group actually consisted of their originally chosen activities, while perceived choice was manipulated through information given to the subjects by the instructors. The number of times that subjects attended the class over a six week period was monitored and constituted the dependent variable.

Results indicated that the choice group had a significantly higher average attendance than the no-choice group over the 6 week period ($p < .01$). A significant trial by treatment interaction ($p < .10$) found was explained by the similarity in attendance across groups during the

early weeks as compared to the difference observed during the latter two weeks, when choice subjects were exercising on the average more than twice as frequently as the no-choice subjects. Thompson and Wankel suggest that the delay in treatment effect could have resulted from the fact that all subjects were recently joined volunteer club members who, because they had chosen to join the program, would feel a reasonable degree of control with respect to attending it at first.

A post-test questionnaire revealed that the perceived choice subjects stated high intentions to exercise in future, and the authors suggest that this intention to exercise, together with the demonstrated success of perceived choice in actually improving exercise attendance, is further encouragement for the use of perceived or actual choice as a program technique.

In summary, Langer's (1975) studies of choice in chance settings and the studies by Thompson (1976) and Thompson and Wankel (1978) relating to attention to diet and exercise regimens have identified an important role for the manipulation of choice in the production of desired behaviors. With regard to the focus of the present study, Thompson and Wankel note that choice as a stimulus to continued attendance may even cast a new light on the traditional leadership role, with leaders needing to play a more supportive and less directive role in class management.

The influence of 'others' on attendance

Hanson (1967), Heinzelmann (1973), Kinal and Brown (1976) and Brawley (1979) suggest that the strengthening of group bonds within the exercise class can be used to encourage continued participation. The setting of group goals such as total weight loss, the publishing of group results, and even the production of a group newsletter are just some of the methods suggested for facilitating group interaction.

While the development of within group camaraderie is a major factor in attendance, the support of those individuals to whom the participant relates on a daily basis appears to be a critical element in assisting exercisers to retain their committment to the program. Illustrative of this fact is a study conducted by Heinzelmann and Bagley (1970), which examined the relationship between the wife's attitude toward the exercise program and her husband's adherence to the program over an 18 month period. Results indicated that a positive attitude on the part of wives was directly related to good or excellent adherence patterns by husbands. A neutral, indifferent or negative attitude by wives was associated with poor attendance behavior by their husbands.

Heinzelmann and Bagley emphasize the important guidelines which these results provide for exercise leaders. The 'significant others' in participant's lives should both be consulted and considered when individuals enroll in a

program of physical activity. If this were to be done, the 'lack of time' excuse proffered by many exercise dropouts (Wanzel, 1978a; Perrin, 1979; Jette, 1979) might be found to be merely a matter of better co-operation among the principal actors in the decision to adopt a more active lifestyle.

The decision-making process and decision balance sheet

Decision-making has been scrutinized in a number of studies relating to exercise adherence. Heinzelmann and Bagley (1970) report a comparative study of the relative effectiveness of a small-group decision-making process and a large-group lecture approach for recruitment and retention of middle-aged men to an exercise program. Noting that the small-group process was more effective in both initiating and maintaining participation in the program, they suggest that group discussion establishes the basis for a more realistic form of commitment as soon as a decision has been made.

Another approach focussing on decision-making is the motivational 'decision balance sheet' developed by Janis and his associates (Janis and Mann, 1968, 1977; Mann, 1972; Hoyt and Janis, 1975; Colten and Janis, 1977).

In reporting their extensive studies relating to the conflicts involved in personal decision-making, Janis and Mann (1977) state that when people make personal decisions they are subject to internal as well as external constraints

that prevent them from recognizing risks that should be taken into consideration in planning if they are to minimize post-decisional stress.

Accordingly, the decision balance sheet (D.B.S.) model is a method for ensuring that a decision maker thoroughly and accurately explores the full range of alternatives open to him, and considers the favorable and unfavorable consequences of each alternative. Specifically, it requires that the individual initiates a list of anticipated gains and losses associated with his commitment to a decision. The following headings are utilized for that purpose: (a) utilitarian gains or losses to self; (b) utilitarian gains or losses for significant others; (c) approval or disapproval of significant others; (d) self-approval or disapproval.

One of the benefits of the decision balance sheet procedure noted by Janis (1968) and Janis and Mann (1977) is that, by anticipating possible negative results beforehand, any post decisional suffering or losses will be minimized. This process is referred to as 'emotional innoculation' in that prior knowledge of negative results is believed to increase a person's tolerance of same by developing effective reassurances and coping strategies.

In clinical therapy counselling, the D.B.S. has been utilized in face to face discussions between patient and counsellor. However, with adults attending health-related classes it has been found practical to ask subjects to compile their balance sheet during a telephone interview.

Colten and Janis (1977), testing the D.B.S. technique with women enrolled in a diet clinic, found that subjects who underwent both a high self-disclosure interview and balance sheet treatment were more effective in monitoring their diet, and significantly more successful in losing weight, than those who received either a high or low self-disclosure interview with no decision balance sheet. Hoyt and Janis (1975) state that positive feedback provided by an interviewer "...fosters an attitude of high reliance upon the helper that increases his or her effectiveness in the role of a norm-sending communicator" (p. 834).

In further examination of the high and low self-disclosure effect, Hoyt and Janis (1975) studied 50 females attending an early morning exercise class, this time making a comparison between two types of balance sheets - relevant and irrevalent - as motivators of attendance. One group of 20 randomly selected subjects was asked to complete a balance sheet relevant to their decision to exercise, while the other group of 20 completed a balance sheet pertaining to the effects of a decision to cease smoking. Upon completion of the balance sheet, subjects were asked to either read to the interviewer (high disclosure), or read quietly to themselves (low disclosure), the information they had recorded, thereby resulting in four groups of 10 for the purpose of experimental manipulation. A control group of 10 exercisers received no treatment. The dependent variable for the study was the attendance of

participants throughout a seven week period.

Results indicated that those subjects who completed the relevant balance sheet actually attended class about twice as often as subjects in either the irrelevant balance sheet or control groups. No significant effect was found for the high or low self-disclosure, nor were there any significant interaction effects.

In discussing these results, Hoyt and Janis reported two processes which may mediate the beneficial effects of completing a decision balance sheet. The first, the emotional innoculation process, has been discussed earlier. Second, the consideration of positive consequences may have a self persuasion effect, particularly when the participant realizes that his actions are more likely to have net positive rather than negative consequences. Examination of the attendance patterns led Hoyt and Janis to suggest that self-persuasion was the more likely explanation for the success of the relevant balance sheet treatment on that occasion, as the attendance difference between groups was observed in the first week immediately following the telephone interview. The authors suggest that had emotional innoculation (going over the negative effects) been responsible for the attendance differences between relevant and irrevalent balance sheet subjects, the observed differences would have become larger in the latter stages of the program as the number of negative consequences encountered by participants began to accumulate.

Wankel and Thompson (1977) carried out a more direct test of the emotional innoculation vs. self-persuasion interpretation of D.B.S. effects. Based on Hoyt and Janis' (1975) interpretation of their results together with predictions from cognitive dissonance theory (Festinger, 1957) and self-perception theory (Bem, 1967), they incorporated a positive-only condition into their study of D.B.S. effects upon exercise attendance.

Theorizing along cognitive dissonance lines, Wankel and Thompson predicted that female attenders of a drop-in exercise class would experience dissonance if they did not attend the program after voluntarily stating a number of positive outcomes to be derived from resumption of attendance. This would result in a tendency to resume attendance in order to reduce this dissonace.

Similarly, on the basis of Bem's self-perception theory, it was held that individuals would infer their attitudes from observing their behavior and the situation in which it occurred. Therefore, if a participant perceived that she had voluntarily identified positive outcomes which might result from exercising in a program, she would be more likely to infer that she was positively predisposed to the program, and hence would attend more regularly. Based on this rationale, Wankel and Thompson suggest that the listing of potential negative outcomes might actually weaken the positive effects and result in less behavioral change.

To test these predictions, female members of a health club who had not attended for at least one month were exposed to one of four treatments and then their attendance at the club was monitored over a six week period. A D.B.S. group was telephoned and subjects were asked to compile a full balance sheet concerning the decision to resume exercise. A positive-only group were similarly telephoned but they were asked only to list the positive outcomes that they expected from the program. A third group was contacted using the usual club telephone format for following up inactive members. A control group received no telephone intervention.

Analysis of the attendance figures over a six week period revealed that the full D.B.S. and the positive-only treatments were both significantly better ($p < .05$) than the regular call up and no-call control groups in increasing attendance. The positive-only treatment was marginally better (but not significantly so) than the full D.B.S. The fact that the positive-only condition was just as effective as the full treatment provides stronger support for the view that self-persuasion rather than emotional innoculation is the underlying basis for D.B.S. effects on attendance.

Despite the success of the balance sheet model with regard to its' effect on resumption of exercise in this study, Wankel and Thompson point out that the overall frequency of attendance was still very low. They suggest

that further investigations of combinations of motivational strategies to both initiate and maintain involvement in exercise are needed.

Summary

Research investigating the important influence of situational factors on exercise attendance has been reported. Changes in exercise objectives, fun, the failure to attain goals, and the degree of perceived activity choice have been shown to affect adherence. The important role played by significant others in the actual behavior of exercisers was discussed. Finally, studies demonstrating that exercise attendance could be positively influenced by the use of a D.B.S. were reviewed.

Despite the knowledge accumulated in personal and situational investigations of participant's attendance, the definitive approach to the prediction and treatment of exercise adherence has not been devised. A number of researchers have proposed that in order to more effectively predict behavior the interaction effect of personal variables with situational factors must be studied. The interactionist theory for the prediction of behavior and a report of sport studies utilizing that approach constitutes the final section of this review.

3. The interactionist approach to behavior

Despite the popularity of the trait approach in the investigation of behavior, its adequacy as a model for

personality research has been questioned by many (Bowers, 1977; Fisher and Ahart, 1973; Magnusson and Endler, 1977; Mischel, 1969; Rushall, 1975). In particular, the association of traits with behavior across different situations has caused much debate, with critics arguing that behavior is situation specific and cannot be separated from the environment.

Situationism examines the environment to find the important factors that determine the behavior of individuals (Magnusson and Endler, 1977). In criticizing situationism, Magnusson and Endler note the difficulty of knowing when a situation begins and when it ends. That is, should a specific event or a family of events, a total situation or elements within the situation, be the focus?

Proponents of the interactionist approach to the study of behavior (Bowers, 1977; Endler, 1973; Magnusson and Endler, 1977) state that, by investigating the mutual interaction of persons and situations, the failings observed in trait and situationist approaches are diminished. The basic unit of analysis in the interactionist model is the person-situation interaction. Its four essential features according to Endler and Magnusson (1976;968) are:

1. Actual behavior is a function of a continuous process of multi-directional interaction (feedback) between the individual and the situation that he or she encounters.

2. The individual is an intentional active agent in this interaction process.

3. On the person side of the interaction, cognitive factors are the essential

determinants of behavior, although emotional facotrs do play a role.

4. On the situation side, the psychological meaning of the situation for the individual is the important determining factor.

The feature to be emphasized about interactionism is its concern for behavioral feedback as an important determinant of perception and action. Bowers (1977; 76) notes that "...Because the organism affects the environment affecting the organism in ongoing sequences of exchange, the interactional paradigm has little truck for hard and fast distinctions between antecedent conditions and behavioral outcomes". The individual is at once the cause and consequence of his environment, and interactions must not be looked at as static instances, but rather as dynamic and changing relationships (Iso-Ahola, 1978). One method commonly adopted for the examination of interactions is a variance components technique derived from analysis of variance. Endler and Hunt (1966) utilized this approach in confirming the importance of interactive effects in their series of studies employing the S-R Inventory of Anxiousness. Results indicated that individual differences accounted for about 4-5% of the variance, situations about 4% for males and about 8% for females, and person x situation interactions accounted for about 10%. By contrast, the three simple two way interactions accounted for more anxiety variance (about 30%) than did the sum of the contributions for persons and situations.

Similarly, Bishop and Witt (1970) found that the interactions involving persons, situation and mode of response explained leisure behavior to a greater extent than singular effects of those variables.

Fisher et al (1977) demonstrated the utility of the interactional model in explaining behavior in a sport situation. Using the S-R Inventory of Anxiousness, they sampled the projected behavior of basketball athletes across a series of 13 anxiousness eliciting game situations. Results compared favorably with those found by Endler and Hunt in that neither persons nor situations contributed substantially to the total variance, whereas the three simple two-way interactions accounted for approximately 33% of the anxiousness variance. Despite this support for the interactionist position, the authors note the large portion (42%) of variance remaining within the residual component, and stress the need for future studies to further analyze situations, especially determining their meaning to individuals, in order to explain this unknown quantity of behavioral variation.

Fiedler (1977) adopted a person by treatment approach to demonstrate that group (and organizational) effectiveness is a function of the interaction of the leader's motivational structure (a personal variable) and the degree to which the situation provides the leader with control and influence. Fiedler's results led him to suggest that it was possible to teach the leader to identify the types of situations

in which he or she was likely to be successful and, if necessary, to modify his/her control and influence to match it to his or her motivational structure.

A method such as Fiedler's for the prediction of behavior in sport and leisure settings is the hope of many sport and leisure researchers (Fisher and Ahart, 1973; Iso-Ahola, 1978). However, experimental treatment of individuals differing on a personality measure by examining behavior within the actual situation have not been frequent. With regard to the problem at hand, there is no available evidence to indicate that such a strategy has been effectively employed to encourage exercise adherence.

The present study was designed to investigate the efficacy of such an approach. The recent arrival on the research scene of an inventory (the SMI) purporting to be able to validly and reliably assess self-motivation levels provides a potentially useful individual difference measure for such a study. At the same time the previous successes reported for the decision balance sheet in encouraging exercise attendance indicate the utility of that technique as a situational treatment for incorporation in an interactionist study.

CHAPTER III

METHODS AND PROCEDURES

METHODS

The sample

Subjects for the study were 52 females (aged 18 to 52 years, $\bar{x}$ = 30) who had registered voluntarily for the Y.M.C.A. Shape Up Edmonton Fitness Program during the winter of 1979. They were enrolled at four of the 16 classes being offered by the Y.M.C.A. at that time.

Five classes were originally included in the study, being selected on the basis of accessability to the researcher and suitability in terms of program similarity at each venue. Participants in one of the classes had to be deleted from the sample, however, because of a combination of an interrupted program format and an inappropriate SMI administration.

The Y.M.C.A. Shape Up Edmonton Fitness Program

The Level 1 shape up program was of five weeks duration and was designed for persons who wished to begin the process of getting fit. Classes met for a 1½ hour time period once a week at local school gymnasia. All classes met in the evening.

Program leaders were themselves volunteers who had been trained in a standard method of class presentation and instructed in the basic principles of exercise physiology at leadership workshops. In return for this training, new

volunteers first assisted an experienced leader with the presentation of a series of exercise sessions, and then assumed the role of class leader at a subsequent program when rostered by the Y.M.C.A.

The presentation of the class was educational in nature. It aimed to teach participants the components of an individual fitness program and expose them to a variety of fitness-related activities for safe warm-up, muscular stretching and strengthening, and aerobic endurance. Further, the program encouraged participants to become regular exercisers by setting targets for their between-class workouts.

This approach to the presentation of exercise classes is endorsed by Gledhill (1975:29), who states...

> It may be advantageous or even essential to outline a rigid training regimen for a given person, but generally speaking it is more desirable to make the individual aware of those concepts which should be considered in the construction of exercise programs.

The self motivation inventory

The SMI (Appendix A) is a 40 item scale designed to assess an individual's tendency to persevere or be self-motivated. It utilizes five-point Likert-type scales which offer a range of scores from 1 (extremely uncharacteristic of me) to 5 (extremely characteristic of me) for each item. Thus, the range of possible scores on the inventory is from 40 to 200, with a high score being indicative of high self-

motivation. (For a complete review of the SMI, see pp 25-29).

PROCEDURES

Administration of the SMI and subject assignment

The researcher attended the first class at each venue and, at the conclusion of the session, requested that participants take 15-20 minutes to complete the SMI. It was explained that the purpose of the inventory was to derive participant information which would enable the Y.M.C.A. and similar exercise programmers to review class formats to meet the needs of clientele.

Especially emphasized was the fact that the assistance of participants was voluntary and that information obtained would be strictly confidential and used for statistical analysis and group interpretation only.

After explicit instructions as to the method of recording answers on the computer sheet and the need for persons to be honest in the selection of statement responses, subjects then completed a personal information sheet and the SMI.

Individual scores on the SMI were calculated upon receipt from each class. The mean score for each class was computed, and subjects in each class were dichotomized into high and low self-motivation groups.

Commencing at either extreme of the range of scores, subjects were paired in both the high and low groups,

and one of each pair was randomly assigned to the treatment condition while the other was assigned to the control group.

The telephone interview

Subjects in the experimental groups were telephoned by the researcher in the period between the first and second class in the series. After identifying himself as ..."the University of Alberta graduate student who administered a questionnaire at the exercise class recently", he went on to explain that he was "conducting a study of factors related to involvement in the Shape Up Edmonton Fitness Program, and would like to ask some questions about things that might affect their involvement in the program."

All subjects agreed to be interviewed and were asked to bring to the telephone a paper and pencil in order to record their responses during the conversation. After reading background information explaining the decision balance sheet manipulation, the researcher directed participants in the development of their own balance sheet relating to their decision to become involved in the exercise program. The following protocol, adapted from that reported by Hoyt and Janis (1975;835), was utilized for this aspect of the study:

> Some evidence indicates that a very useful way for people to consider some decision they've made or are making - like deciding to take an exercise class - is to write down the advantages and disadvantages that will result from their decision. Often, in going

through the process of actually writing down the considerations involved in a decision, people think of benefits and difficulties they did not originally realize were involved, and it is useful to be aware of them. What I would like you to do is spend the next few minutes writing down the benefits you hope to gain from taking the exercise class. The way I'd like you to do that is this: draw a line down the middle of your page please. At the top left of the page, write down a heading, GAINS TO SELF. Would you do that now please?

Okay! Now I'd like you to list all the potential gains and benefits that might result from your regularly attending the exercise class. Don't tell me what you are writing, just try to include as many considerations as you think relevant. Be sure to be frank and candid, including all personal considerations that might affect your regular attendance. (In the event that a participant needed helpful suggestions to think of items in any category, the researcher read corresponding items from a decision balance sheet concerning 'Giving Up Smoking'. (See Appendix B). Take about a minute to do that. Okay. All right, go ahead.

Finished? Good! Now what I'd like you to do is write a heading, LOSSES TO SELF on the top right side of the page and again list all you can think of, being frank and honest. Here you will want to include any difficulties, inconveniences or expenses you may encounter. Is that all right? Okay, go ahead.

Finished? Well done. Could you make another heading on the left side please, GAINS TO IMPORTANT OTHERS. Here you might list the benefits and advantages to be gained by your important acquaintances as a result of your continuing in the exercise class. Would you do that now please? Good.

Ready? Good. On the right of that list could you make a heading, LOSSES TO IMPORTANT OTHERS and here you might list any difficulties or inconveniences which might affect your important acquaintances as a result of your

being in the exercise class. Is that okay? Good. Go ahead please.

Finished? Okay! Could you please make another heading on the left side of your page, APPROVAL FROM OTHERS and list all the possible ways in which your attending the exercise class might gain you approval from others. Would you do that now please? Thank you.

Finished? Okay! Could you now make a heading, DIAPPROVAL FROM OTHERS on the right side, and here you could list any reasons why others might disapprove of you continuing in the exercise class. Okay. Go ahead. Let me know when you are finished.

Ready. Good. The column on the left this time is headed SELF-DISAPPROVAL. Would you write that down, and list those ways in which your attendance at the exercise class will result in your own self-approval. Okay. Go ahead.

Finished? Okay! The last column on the right is headed SELF-DISAPPROVAL. Would you write that please and list any feelings of self-disapproval which might result from your attending the exercise class. Okay. Go ahead.

All right, now that you're finished with the list, I'd like you to spend a couple of minutes reading the list over aloud to me, reviewing the benefits you can gain from the exercise program and the difficulties you will have to overcome. The way I'd like you to do this is to concentrate on one category at a time, for example, the GAINS TO SELF category - thinking about the benefits to be gained. When you think about the losses and disapprovals categories, I'd like you to realize that to be successful in regularly attending class, you will have to deal with or overcome the losses or disapprovals if they arise. I'd like you to concentrate on one category until I signal you to go on to the next one. If you don't have any entries under some category, spend the time trying to think of possible considerations you may have overlooked the first time through, and jot them in.

Okay, let's start with the GAINS TO SELF category. Read aloud to me the benefits

> you've listed, and try to vividly imagine these. We'll move through all the categories spending about 30 seconds on each.

The researcher then replied to balance-sheet entries that were favourable to following the desired course of action - continuing to attend the exercise class - with responses such as "Good", "Yes", and "That's an advantage", whereas negative entries were responded to with statements such as "Yes, that can be a problem" and "It's good that you are aware of that".

After all categories had been reviewed, the interview concluded in the following manner:

> Thank you for your co-operation; you've been most helpful. We know that exercise has many benefits so I hope you enjoy the program and continue to be active once it is completed. Would you please not discuss this phone call with any other members of your class as it is important for each person to generate her own list of entries without forethought. Thank you once again, and enjoy your class!

Attendance monitoring

The recording of participant attendance was a required duty of all program leaders, and a class list was provided for that purpose. It was impressed upon all leaders that this record must be accurately maintained throughout the course.

After the final class at each venue, leaders forwarded the completed attendance forms to the program headquarters, from where they were retrieved by the

researcher.

The experimental design

The experimental design for the study was a 2 x 2 factorial design with the two independent variables being the level of self-motivation (high, low) and treatment condition (decision balance sheet, control). The dependent variable for the study was participants total attendance measured over a four week period (weeks 2, 3, 4 and 5 of the program).

A diagrammatical representation of the design is presented in Table I.

TABLE I

EXPERIMENTAL DESIGN

		TREATMENT	
		DBS	CONTROL
SELF-MOTIVATION	HIGH	n = 13	n = 13
	LOW	n = 13	n = 13

**The treatment was administered after week one of the program. Attendance data utilized for the experiment is recorded for weeks 2, 3, 4 and 5.

Data Analysis

Data was analyzed at the Computer Sciences Centre, University of Alberta, using the Statistical Package for

the Social Sciences (SPSS) program.

The attendance data for all groups was submitted to a two-way analysis of variance to test the hypothesized main and interaction effects of levels of self-motivation and treatment on attendances over the four weeks. Because of an interruption in the Shape-Up Program during the last week, the attendance data for weeks 2, 3 and 4 only was also analyzed by analysis of variance.

Post-hoc analysis utilizing linear regression (Snedecor and Cochran, 1967) was also conducted. Regression equations were developed for rate of dropping out over the first four weeks of the program (weeks 1, 2, 3 and 4) for each of the four groups. Analysis of the beta weights was performed to determine if the dropout rates for the various groups were significantly different.

As this was an exploratory study in a field setting, in which there was a limited range of variability in the dependent variable and little separation in the levels of the organismic factor, a lenient significance level of $\alpha = .10$ was adopted for the study.

CHAPTER IV

RESULTS AND DISCUSSION

Introduction

Comparative group data

Sample and group means and standard deviations for age and scores on the SMI are reported in Table II. The following symbols were utilized for the description of the four groups: HT = high self-motivated - treatment; HC = high self-motivated - control; LT = low self-motivated - treatment; LC = low self-motivated - control.

TABLE II

SAMPLE AND GROUP MEANS FOR AGE AND SELF-MOTIVATION SCORES

GROUP	Age (Years)		SMI Scores	
	MEAN	SD	MEAN	SD
All (n=52)	29.9	9.6	138.9	23.2
High self-motivation	29.6	8.8	157.8	12.4
HT	28.0	8.0	156.5	12.5
HC	31.3	9.2	159.2	11.7
Low self-motivation	30.1	10.3	119.9	14.4
LT	31.8	11.0	119.5	12.5
LC	28.5	9.1	120.3	16.1

Attendance data

The total, mean, and standard deviations for attendance for all groups are summarized in Table III and group attendance is portrayed graphically in Figure 1.

TABLE III

TOTALS, MEANS AND STANDARD DEVIATIONS
FOR ATTENDANCE OF ALL GROUPS

GROUP	Attendance (weekly) 2	3	4	5	TOTAL	MEAN	SD
HT	10	9	8	3	30	2.3	1.2
HC	10	5	7	6	28	2.15	1.34
LT	11	8	7	4	30	2.3	1.45
LC	8	6	3	2	19	1.46	1.21

RESULTS

The results of the two-way analysis of variance on the attendance data after the final class are contained in Table IV.

TABLE IV

SUMMARY OF THE ANALYSIS OF VARIANCE
OF TOTAL ATTENDANCE

SOURCE OF VARIATION	SUM OF SQUARES	df	MEAN SQUARE	F	F. PROB.
Main effects	4.808	2	2.404	1.399	0.257
Motivation	1.558	1	1.558	.907	0.346
Treatment	3.250	1	3.250	1.892	0.175
2-way interaction	1.558	1	1.558	.097	0.346
Explained	6.365	3	2.122	1.235	0.307
Residual	82.461	48	1.718		
Total	88.827	51			

No significant main effects or interactions were located; however, inspection of the raw attendance data

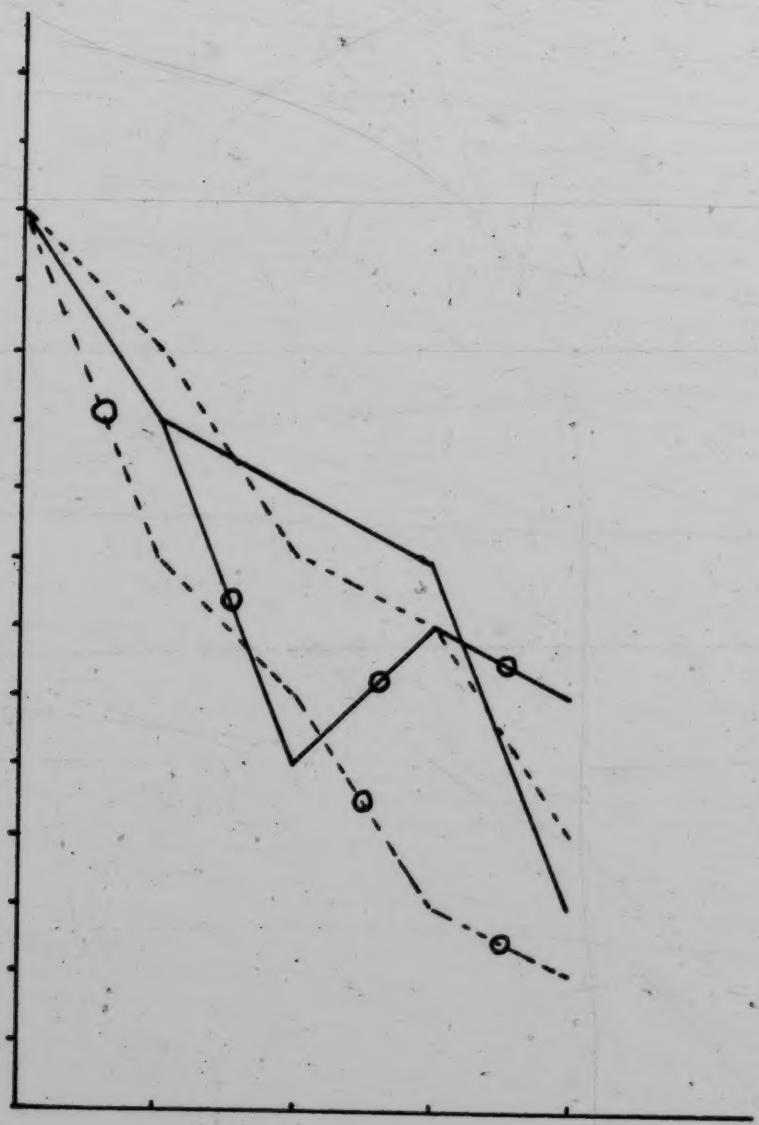

Figure 1: Attendance of the four treatment groups over the five weeks of the Shape-Up Edmonton Fitness Program.

revealed an unusually large drop in attendance during the last week of the program. Further investigation revealed that the final session at one venue had been postponed accounting for much of the drop off. To remove this spurious effect, an analysis of variance of the attendance totals for only the first three weeks after the treatment (ie. weeks 2, 3 and 4) was conducted. The results of that analysis are reported in Table V.

TABLE V

SUMMARY OF ANALYSIS OF VARIANCE
OF ATTENDANCE TOTALS AFTER WEEK FOUR.

SOURCE OF VARIATION	SUM OF SQUARES	df	MEAN SQUARE	F	F. PROB.
Main effects	4.462	2	2.231	2.041	0.141
Motivation	0.692	1	0.692	0.633	0.430
Treatment	3.769	1	3.769	3.449*	0.069
2-way interaction	0.308	1	0.308	0.282	0.598
Explained	4.769	3	1.590	1.455	0.239
Residual	52.461	48	1.093		
Total	57.231	51	1.22		

*p ⟨ .10

The significant treatment main effect (p ⟨ .10) indicates that the attendance of subjects who had received the decision balance sheet was significantly better than subjects who had received no treatment. No main effect for self-motivation and no interaction effects were found.

However, comparison of the raw attendance differences between the high self-motivation group and between the low

self-motivation groups suggested the presence of some interaction (Table III). In order to examine group trends over time, group dropout rates were calculated and compared by regression analysis (Table IV). This method, by considering a series of points when comparing the dropout rates (betas) of the four groups, provides a more thorough investigation of the experimental effects than the analysis of variance method which just examines overall group means.

TABLE VI

INTERCEPTS, BETA COEFFICIENTS AND R^2 VALUES FOR DROPOUT RATES BY GROUPS PER WEEK

GROUP	INTERCEPT	BETA	R^2
HT	14.0_a	-1.6_b	0.91
HC	14.5_a	-2.3_{ab}	0.72
LT	15.0_a	-2.1_b	0.97
LC	15.5_a	-3.2_a	0.97

$Y = 14.75 - 2.3\ X$

*Beta coefficients followed by the same letter are not significantly different at the .10 level of probability.

Intercepts and beta coefficients are utilized to calculate the simple regression lines using the formula $Y = a + bx$, where Y is the predicted value of the dependent variable, a is a constant value representing the Y intercept, b is a constant indicating the slope of the regression line and denotes the change in Y brought about by a unit change

in X, and X is the independent variable (Christensen, 1977:553). The regression lines indicating the dropout rate for each experimental group are depicted in Figure 2.

When the regression lines were compared (Snedecor and Cochran:432), significant F scores were found for HT vs LC conditions ($F = 8.53$, $df = 1.4$; $p < .10$) and for the LT vs LC conditions ($F = 4.84$; $df = 1.4$; $p < .10$).

To facilitate later discussion of the effects of the treatment on attendance, the number of dropouts (ie. subjects who failed to continue in the program after each class) is presented in Table VII.

TABLE VII

GROUP DROPOUTS AND TOTAL PERCENTAGE DROPOUTS AFTER EACH WEEK OF THE PROGRAM

GROUP		Weeks 1	2	3	4
HT	n=13	2	0	3	5
HC	"	2	3	0	2
LT	"	1	2	2	4
LC	"	4	1	3	2
TOTAL PERCENTAGE		17%	14%	21%	45%

*Figures in Table VII indicate the number of persons who dropped out after each class, not the number absent each week.

DISCUSSION

Differences observed in raw attendance data across

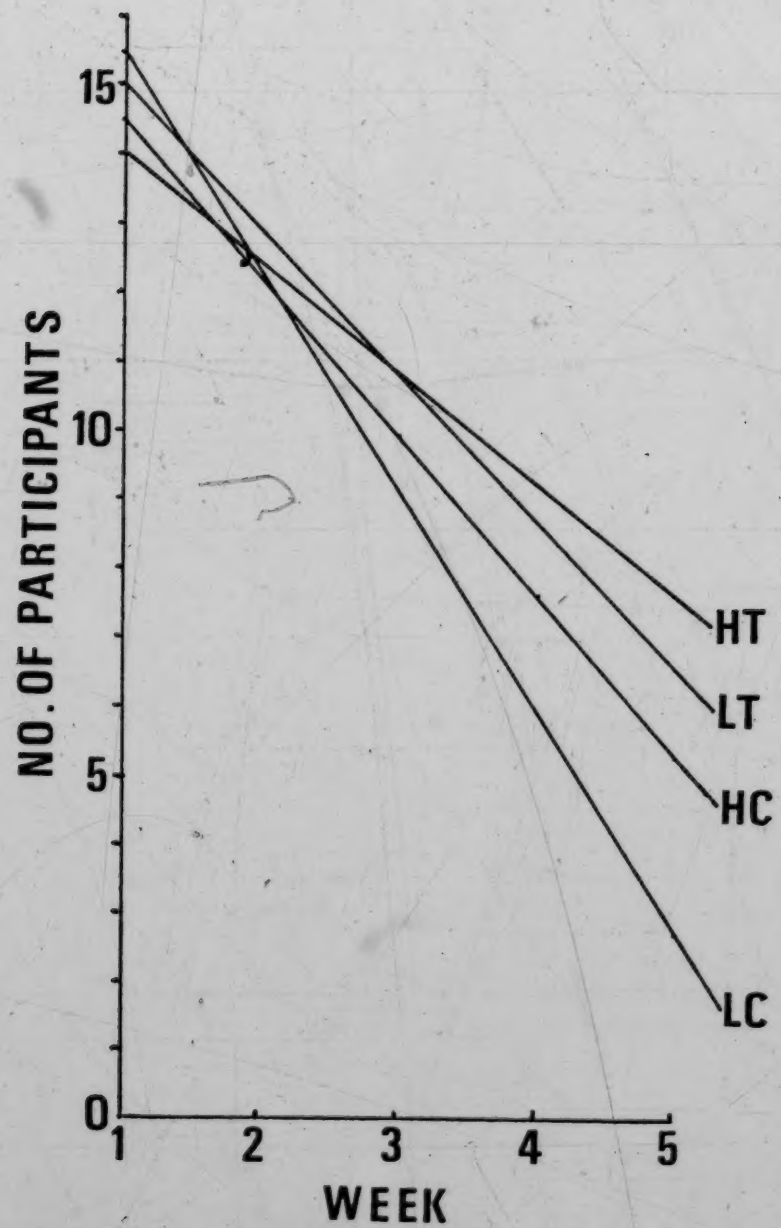

Figure 2: Regression lines for dropout rates by groups.

all groups (Table III) led to the anticipation of some statistical support for the hypotheses established for this study. However, two-way analysis of variance (Table IV) revealed no significant main or interaction effects on attendance for the four weeks of the program after the decision balance sheet treatment had been administered.

In view of the unusually high (45%) number of dropouts after the fourth week of the program (Table VII), a check was made with the program organizer and class leaders to determine if any explanation existed for this phenomenon. It was found that the program format at the largest class (N = 28) had been interrupted after week four, resulting in a one week postponement of the final class. Whereas eleven subjects had attended the fourth class (4HT, 3HC, 3LT, 1LC), only three (2HC, 1LT) had returned for the final class after the two week layoff. In a telephone interview, three of the HT subjects indicated that the extension of the program by one week had resulted in a commitment clash for the revised date of the final class, while two subjects (1LT, 1HC) reported that they thought the class had finished the previous week. It would appear therefore that postponement of the final class at that one venue was responsible for the difference observed in HT attendance figures from week four to week five (Table III). In view of this complication in the last week of the program, it was considered desirable to exclude the attendance data for

week five from the analysis of results. From this point then, the discussion will consider experimental effects observed utilizing attendance for weeks two, three and four only.

Self-motivation as a predictor of adherence

The first hypothesis developed for this study was that ...subjects scoring high on the SMI would attend more exercise classes than subjects scoring low on the SMI. While high self-motivated subjects actually recorded a total of 49 attendances compared to 43 attendances for low self-motivated subjects, the analysis of variance revealed that this difference was not significant (Table V). The predictive ability of self-motivation reported by Dishman, Ickes and Morgan (in press) was therefore not confirmed on this occasion.

One factor which may have attenuated the predictive potential of the SMI in this study was that the small sample (N = 52) necessitated the inclusion of all subjects in the experiment. As a result, the high and low self-motivated groups included many subjects whose scores did not differ greatly, and it was not surprising that the attendances of these persons were quite similar. If the original sample had been larger, it would have been advantageous to select only the top 30% and the bottom 30% of subjects (according to their SMI score) to represent the high and low self-motivated groups in order that they might accurately depict

the extremes on this variable.

The utility of the SMI was not entirely without support however. The results of the linear regression analysis (Table VI) indicate that a significant difference existed between the dropout rates of the LT and LC groups, but not between those of the HT and HC groups. It appears worthwhile therefore to use the SMI to identify the low self-motivated participants in an exercise program, as the application of a treatment had the effect of reducing the drop-out rate among that group on this occasion.

The decision balance sheet as an adherence factor

The hypothesis that subjects administered the telephone interview decision balance sheet would attend more exercise classes than subjects in a control group was confirmed by the significant main treatment effect found in the analysis of variance (Table V). This result supports those found by Hoyt and Janis (1975) and Wankel and Thompson (1977) in emphasizing the value of the DBS in the treatment of adherence to exercise.

The interaction effect of DBS and SMI

The third hypothesis, that the DBS treatment would have a greater positive effect on the program attendance of low rather than high self-motivated subjects, was not supported statistically when the analysis of variance was conducted (Table V). However, support for the differential effect of the treatment on the two self-motivation groups was

provided by the results of the regression analysis examining the dropout rates characteristic of each group during the first four weeks of the program. The fact that the LT group evidenced a significantly lower dropout rate than the LC group, while there was no difference in the dropout rates of the high self-motivation groups, lends some support therefore to the hypothesized interaction.

This finding that the decision balance sheet treatment reduced the dropout rate for low self-motivated subjects is especially significant when one considers the fact that the mean SMI score was utilized to determine the low self-motivated groups. A more powerful interaction might be anticipated in studies where more extreme proportions of the range of self-motivation scores were utilized for selection of subjects for treatment.

Further interpretation of results

Nine subjects (17%) failed to continue in the program after the opening class (Table VII). This is consistent with evidence from other exercise settings (Saane, 1973) and medical therapies (Baekland and Lundwall, 1975) indicating that there is a high attrition rate in the initial stages of exercise programs. It appears extremely important that the initial exposure to an exercise class is a pleasing one. Brawley (1979:35) advises that ..."the leader should emphasize to participants the way in which his program satisfies their unique participation motive." In this

regard, the exercise program utilized for this study was open to participants from 18 to 60 years of age, and perhaps satisfying the 'unique participation motives' of such a diverse group is too difficult a task.

Despite this high initial dropout, the treatment groups evidenced a 68% attendance rate over the first three weeks of the program which, in comparison with adherence rates reported for other exercise programs (Kasch and Carter, 1970; Wilmore et al, 1970) should not be considered unsatisfactory. However, trends observed in the regression lines (Figure 2) depicting dropout rates suggest that a program such as this could conceivably lose all its participants by the end of the ninth week. The five week duration of the program appears to be a maximum desirable length while it is presented in this form.

To retain participants in exercise programs over a longer period, the use of the SMI and the DBS treatment may need to be combined with other strategies to produce an even stronger program intervention. Thompson and Wankel's (1978) study, in which treatment subjects were allowed to choose an additional new activity every third visit to a health club, demonstrated the value of an ongoing intervention rather than a once-only treatment. At the end of a 6 week period, the choice subjects were exercising, on the average, more than twice as frequently as the no-choice control subjects. It would appear useful therefore to incorporate an ongoing treatment in an exercise program once

the Self Motivation Inventory and Decision Balance Sheet have been used to identify potential class dropouts.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

SUMMARY

The purpose of the study was to categorize subjects into high and low self-motivation groups according to their scores on the Self Motivation Inventory, and to investigate the effect of a telephone interview incorporating a decision balance sheet format on the exercise adherence of high and low self-motivated females. Subjects for the study were fifty-two adult females. Individual scores on the self-motivation inventory were used to dichotomize the sample into high and low self-motivated groups of twenty-six persons each. On the basis of similar scores, subjects were paired and ramdomly assigned to either a treatment or control condition. Subjects in the treatment condition were telephoned by the researcher before the second class and instructed to compile a decision balance sheet concerning their decision to attend the exercise program. The attendance of all subjects over the remaining four weeks of the class was monitored and constituted the dependent variable for the study; however, due to a program postponement at one venue, the attendance of subjects for weeks two, three and four only was utilized for that purpose.

Group attendance data after week four of the program were used in the calculation of two-way analysis of variance to examine the main and interaction effects of self-motivation and the decision balance sheet treatment. Also, regression

analysis was performed to compare the dropout rates characteristic of each group through weeks one to four of the program. Results of the analysis of variance indicated a significant effect of the decision balance sheet treatment, but no main effect for self-motivation and no treatment X self-motivation interaction were found. However, the results of the regression analysis indicated a significant difference existed between the dropout rates of the Low Treatment and Low Control groups, but not between the dropout rates of the High Treatment and High Control groups. This result, therefore, provided some support for the use of both self-motivation scores and the decision balance sheet in the encouragement of exercise adherence.

CONCLUSIONS

1. No difference was observed in the program attendance of high and low self-motivated subjects in this study.
2. The attendance of participants during the first three weeks of the program was facilitated by the decision balance sheet treatment.
3. Weak support was found for the hypothesis that the decision balance sheet treatment would have a greater positive effect on the program attendance of low self-motivated subjects than high self-motivated subjects.

RECOMMENDATIONS

The results of this study lead to recommendations both for future research and also for the presentation of

exercise classes by practitioners.

For future research

1. The tentative support engendered for the influence of both self-motivation and the decision balance sheet treatment on exercise adherence in this study suggests that these two variables should be re-examined. The next study should be conducted over a longer time period, where more variability in the dependent measure is possible. A larger sample should also be sought in order that the high and low self-motivation groups may represent the extremes of the self-motivation range, rather than both halves of the sample as in the present study.
2. A future study should examine the effects of self-motivation and decision balance sheet treatment in a number of matched classes in order that class factors influencing adherence can be examined.
3. There is a need for future research using the decision balance sheet as a treatment to include other variables such as choice in order to compliment the effect attributed to that treatment.

For the practitioner

1. The decision balance sheet approach to the encouragement of exercise adherence should be utilized by organizers when a leader or assistant is available to both administer the treatment and reinforce the resultant

desired attendance.

2. Exercise classes should be presented which meet the needs of specific age, ability and interest groups within the adult population, rather than the program studied at this time which aimed to cater for adults from 18 to 60 years of age.

3. The number of exercise classes in a program should be determined by the time needed to achieve goals relevant to the participants needs. Participants should receive clear instructions informing them of the objectives of each class.

4. A relationship was observed between interruption of program format and poor attendance in this study. Class leaders should avoid program interruptions if possible, and ensure that clear instructions are given for alternate arrangements when program postponement is unavoidable.

APPENDIX A

THE SELF MOTIVATION INVENTORY

The Self-Motivation Inventory

Read each of the following statements and circle by each item the letter of the alternative which best describes how characteristic the statement is when applied to you. The alternatives are:

a. extremely uncharacteristic of me

b. somewhat uncharacteristic of me

c. neither characteristic nor uncharacteristic of me

d. somewhat characteristic of me

e. extremely characteristic of me

Please be sure to answer every item and try to be as honest and accurate as possible in your responses. Your answers will be kept in the strictest confidence.

1. I'm not very good at committing myself to do things. a b c d e

2. Whenever I get bored with projects I start, I drop them to do something else. a b c d e

3. I can persevere at stressful tasks even when they are physically tiring or painful. a b c d e

4. If something gets to be too much of an effort to do, I'm likely to just forget it. a b c d e

5. I'm really concerned above developing and maintaining self-discipline. a b c d e

6. I'm good at keeping promises, especially the ones I make to myself. a b c d e

7. I don't work any harder than I have to. a b c d e

8. I seldom work to my full capacity. a b c d e

9.	I'm just not the goal-setting type.	a	b	c	d	e
10.	When I take on a difficult job, I make a point of sticking with it until it's completed.	a	b	c	d	e
11.	I'm willing to work for things I want as long as it's not a big hassle for me.	a	b	c	d	e
12.	I have a lot of self-motivation.	a	b	c	d	e
13.	I'm good at making decisions and standing by them.	a	b	c	d	e
14.	I generally take the path of least resistance.	a	b	c	d	e
15.	I get discouraged easily.	a	b	c	d	e
16.	If I tell somebody I'll do something, you can depend on it being done.	a	b	c	d	e
17.	I don't like to overextend myself.	a	b	c	d	e
18.	I'm basically lazy.	a	b	c	d	e
19.	I have a very hard-driving, aggressive personality.	a	b	c	d	e
20.	I work harder than most of my friends.	a	b	c	d	e
21.	I can persist in spite of pain or discomfort.	a	b	c	d	e
22.	I like to set goals and work toward them.	a	b	c	d	e
23.	Sometimes I push myself harder than I should.	a	b	c	d	e
24.	I tend to be overly apathetic.	a	b	c	d	e
25.	I seldom if ever let myself down.	a	b	c	d	e
26.	I'm not very reliable.	a	b	c	d	e
27.	I like to take on jobs that challenge me.	a	b	c	d	e
28.	I change my mind about things quite easily.	a	b	c	d	e

29.	I have a lot of will power.	a b c d e
30.	I'm not likely to put myself out if I don't have to.	a b c d e
31.	Things just don't matter much to me.	a b c d e
32.	I avoid stressful situations.	a b c d e
33.	I often work to the point of exhaustion.	a b c d e
34.	I don't impose much structure on my activities.	a b c d e
35.	I never force myself to do things I don't feel like doing.	a b c d e
36.	It takes a lot to get me going.	a b c d e
37.	Whenever I reach a goal, I set a higher one.	a b c d e
38.	I can persist in spite of failure.	a b c d e
39.	I have a strong desire to achieve.	a b c d e
40.	I don't have much self-discipline.	a b c d e

Thank you for your assistance

APPENDIX B

SAMPLE DECISION BALANCE SHEET

SAMPLE DECISION BALANCE SHEET

GIVING UP SMOKING

GAINS TO SELF

-feel healthier
-save money

LOSSES TO SELF

-appetite increases
-tension increases when not smoking

GAINS TO IMPORTANT OTHERS

-won't smell up the house
-live longer, healthier

LOSSES TO IMPORTANT OTHERS

-may become nervous, irritable
-become hard to live with

APPROVAL FROM OTHERS

-family could be pleased
-husband wants me to stop

DISAPPROVAL FROM OTHERS

-others feel guilty if they cannot stop smoking

SELF-APPROVAL

-will power
-pride

SELF-DISAPPROVAL

-disappointed because I like smoking

APPENDIX C

INDIVIDUAL ATTENDANCE RECORDS BY GROUPS

GROUP	SUBJECT	WEEKLY ATTENDANCE 2	3	4	5	TOTAL (N=4)
HIGH TREATMENT	1	-	-	-	-	0
	2	x	x	-	-	2
	3	-	x	x	-	2
	4	x	-	x	-	2
	5	x	x	x	-	3
	6	x	x	-	-	2
	7	x	x	x	-	3
	8	x	-	x	x	3
	9	-	0	-	-	0
	10	x	x	x	x	4
	11	x	x	x	x	4
	12	x	x	-	-	2
	13	x	x	x	-	3

GROUP	SUBJECT	WEEKLY ATTENDANCE 2	3	4	5	TOTAL (N=4)
LOW TREATMENT	1	-	-	-	-	0
	2	x	x	x	x	4
	3	x	-	x	-	2
	4	x	x	x	-	3
	5	x	-	-	-	1
	6	x	x	-	x	3
	7	-	x	-	-	1
	8	x	-	x	-	2
	9	x	-	-	-	3
	10	x	x	x	x	4
	11	x	x	-	-	2
	12	x	x	x	-	3
	13	x	x	x	x	4

GROUP	SUBJECT	WEEKLY ATTENDANCE 2	3	4	5	TOTAL (N=4)
HIGH CONTROL	1	x	x	x	x	4
	2	x	-	-	-	1
	3	x	x	x	-	3
	4	x	-	-	-	1
	5	x	-	-	-	1
	6	x	x	-	x	3
	7	x	-	x	x	3
	8	x	-	x	x	3
	9	x	-	x	x	3
	10	-	x	x	-	2
	11	-	-	-	-	0
	12	-	-	-	-	0
	13	x	x	x	x	4

GROUP	SUBJECT	WEEKLY ATTENDANCE 2	3	4	5	TOTAL (N=4)
LOW CONTROL	1	-	-	-	-	0
	2	x	x	-	-	2
	3	x	-	-	x	2
	4	x	x	-	-	2
	5	-	x	-	-	1
	6	x	x	x	-	3
	7	x	x	-	-	2
	8	-	-	-	-	0
	9	-	-	-	-	0
	10	-	-	-	-	0
	11	x	x	x	x	4
	12	x	-	-	-	1
	13	x	-	x	-	2

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